

39. The method of claim 38, wherein the drilling tubular is selected from the group consisting of (A) a drill string and (B) a coiled tubing.
40. The method of claim 38, wherein the location of the transmitter antennas and the receiver antennas is selected from the group consisting of (i) a recess in the enclosure and (ii) a plurality of apertures in the enclosure.
41. The method of claim 38, wherein the at least one frequency further comprises at least two frequencies.

REMARKS

Claims 1 - 41 are pending in the application. Claims 1 - 41 stand rejected by the examiner. Claims 1, 25, 27, and 35 are canceled. Claims, 2-4, 7-9, 12, 18-19, 22-24, 28-30, 32, 34, 38, 38 and 40-41 are amended. The title is amended. Drawings are submitted herewith with proposed changes in accordance with the Examiner's requirements. No new matter has been added by the amendments. Reconsideration of the application, as amended, is respectfully requested. The examiner's objections and rejections are addressed in substantially the same order as in the referenced office action.

SPECIFICATION

The Examiner suggests that the title submitted by Applicant is not clearly indicative of the invention claimed. Applicant has amended the title as suggested by the Examiner,

but has omitted the reference to laboratory environment for reasons made clear by the amendments and discussion below.

DRAWINGS

The Examiner objects to Figures 1 and 2A as not indicating that the figures show prior art. Applicant submits herewith the figures with --(Prior Art) -- indicated as required by the examiner.

CLAIM OBJECTIONS

The examiner objects to claim 4 as it does not include a period at the end of the claim. Claim 4 is amended with this response to correct the clerical error.

35 USC § 112 REJECTIONS

The examiner rejected claims 8, 15, 27, 30-31 and 38 under 35 USC § 112 second paragraph as being indefinite. Applicant respectfully traverses as the claim language is clear and commonly used throughout numerous patents granted by the USPTO. Moreover, the language of the rejection does not correspond to rejected claims 15 and 27.

The examiner suggests that the limitation "core bit operatively coupled to the cylindrical enclosure" is unclear. The second to last sentence seems to ask how a formation sample is separated from a formation, and the last sentence states that the structure as a whole is confusing and unclear.

A core bit is well known in the art from the earliest days of formation testing and geological survey. Today, there is a relatively complete body of knowledge relating to

separating a formation sample from a subterranean formation using drill bits known as core bits and housing the sample in a core barrel, which is commonly a cylindrical enclosure. Thus, a core bit in combination with a cylindrical enclosure is a well known combination to separate a formation sample from the formation. The term “operatively coupled” as used in the claims is a common claim drafting term simply used to indicate a functional relationship between two claim elements as opposed to merely being coupled. In a structural sense, the term operatively coupled is used to ensure that no inference of a direct coupling is taken. Therefore, the limitation “core bit operatively coupled to the cylindrical enclosure” is clear and unambiguous.

For the reasons discussed above, Applicant respectfully requests that the Examiner reconsider the rejection of claims 8, 30-31 and 38.

Regarding rejected claims 15 and 27, the reasons cited in the rejection do not correlate to the claims. Claims 15 and 27 do not have the limitation of a “core bit operatively coupled to the cylindrical enclosure”. Therefore, Applicant requests reconsideration of claims 15 and 27.

35 USC § 103 REJECTIONS

Claims 1-7, 9-14, 16-26, 28-29, 32-37, and 39-41 stand rejected under 35 U.S.C. 103(a) as being obvious and unpatentable over Sinclair (US 4,996,489).

Claims 1, 15 and 27 are canceled, and claims 8, 23 and 30 are amended. No new matter is added with the amendments. Rewritten claims 8, 23, 30 and 38 are directed toward testing a material downhole using a core bit to separate a formation sample to a

cylindrical enclosure such as a core barrel. The sample is then tested using at least one transmitter propagating electromagnetic into the sample and a receiver for measuring the electromagnetic radiation in the material at the frequency.

The '489 reference, either alone or in combination with any reference of record, does not teach or suggest such downhole testing of a material. It is only with the benefit of Applicants disclosure that those skilled in the art could practice a downhole testing apparatus and method as claimed. Applicant respectfully submits that these rewritten claims and each dependent claim depending therefrom are all allowable over the art of record.



VERSION WITH MARKINGS TO SHOW AMENDMENTS

Claims 1, 15, 27, and 35 are canceled without prejudice.

Claims 8, 23, 30 and 38 are amended as follows:

8. [The apparatus of claim 1 wherein the material is] An apparatus for measuring a parameter of interest of a material in a subterranean formation, the apparatus [further] comprising:

- (a) a cylindrical enclosure for enclosing the material;
- (b) at least one transmitter having an antenna on the inside of the cylindrical enclosure for propagating electromagnetic radiation in the material at at least two frequencies;
- (c) at least one receiver having an antenna on the inside of the cylindrical enclosure for measuring electromagnetic radiation in the material at each of the at least two frequencies, the measurements indicative of the parameter of interest;
- ([i]d) a core bit operatively coupled to the cylindrical enclosure for separating the material from the subterranean formation;[.] and[. (ii)]
- (e) a drilling tubular for conveying the cylindrical enclosure into a borehole in the subterranean formation wherein the drilling tubular is selected from the group consisting of (A) a drill string and (B) a coiled tubing.

23. [The method of claim 15 further] A method for determining a parameter of interest of a material comprising:

- ([i]a) operatively coupling a core bit to [the] a cylindrical enclosure;

([ii]b) conveying the cylindrical enclosure into a borehole in a subterranean formation on a drilling tubular selected from the group consisting of (A) a drill string and (B) a coiled tubing; [and]

([iii]c) operating the core bit for separating the material from the subterranean formation;

(d) enclosing the material in the cylindrical enclosure;

(e) inducing electromagnetic radiation in the material using at least one transmitter antenna on the inside of the cylindrical enclosure transmitting at least two frequencies; and

(f) measuring with at least one receiver antenna the induced electromagnetic radiation in the material at each of the frequencies, the measurements indicative of the parameter of interest.

30. [The apparatus of claim 27 wherein the material is] An apparatus for measuring a parameter of interest of a material in a subterranean formation, the apparatus [further] comprising:

(a) a cylindrical enclosure for enclosing the material;

(b) at least two transmitters each having an antenna on the inside of the cylindrical enclosure for propagating electromagnetic radiation in the material at least one frequency;

(c) at least two receivers each having an antenna on the inside of the cylindrical enclosure for measuring electromagnetic radiation in the material at the at least one frequency, wherein the at least two transmitters are symmetrically arranged about

the at least two receivers, the measurements indicative of the parameter of interest;

([i]d) a core bit operatively coupled to the cylindrical enclosure for separating the material from the subterranean formation; and[,]

([ii]e) a drilling tubular for conveying the cylindrical enclosure into a borehole in the subterranean formation.

38. [The method of claim 35 further] A method for determining a parameter of interest of a material comprising:

([i]a) operatively coupling a core bit to [the] a cylindrical enclosure;

([ii]b) conveying the cylindrical enclosure into a borehole in a subterranean formation on a drilling tubular; [and]

([iii]c) operating the core bit for separating the material from the subterranean formation;

(d) enclosing the material in the cylindrical enclosure, wherein the enclosure includes a first transmitter antenna and a second transmitter antenna arranged symmetrically about a first receiver antenna and a second receiver antenna;

(f) inducing electromagnetic radiation in the material by sequentially activating the first and second transmitter antennas at at least one frequency; and

(g) measuring with the first and second receiver antennas the electromagnetic radiation induced in the material by the first and second transmitter antennas, said measurements indicative of the parameter of interest.

Claims 2-3 and 7, 9, 12, 16, 18-19, 22, 24, 28-29, 32, 34, 36, and 40-41 are amended to properly depend from the corresponding rewritten claims 8, 23, 30 and 38.

Claim 4 is amended to properly depend from rewritten claim 8 and to add a period at the end of the claim.

Claims 5-6, 10-11, 13-14, 17, 20-21, 25-26, 31, 33, 37, and 39 are not amended.

CONCLUSION:

For all of the foregoing reasons, Applicants submits that the application is in a condition for allowance. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account **02-0429 (414-16782-US)**.

Respectfully submitted,

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